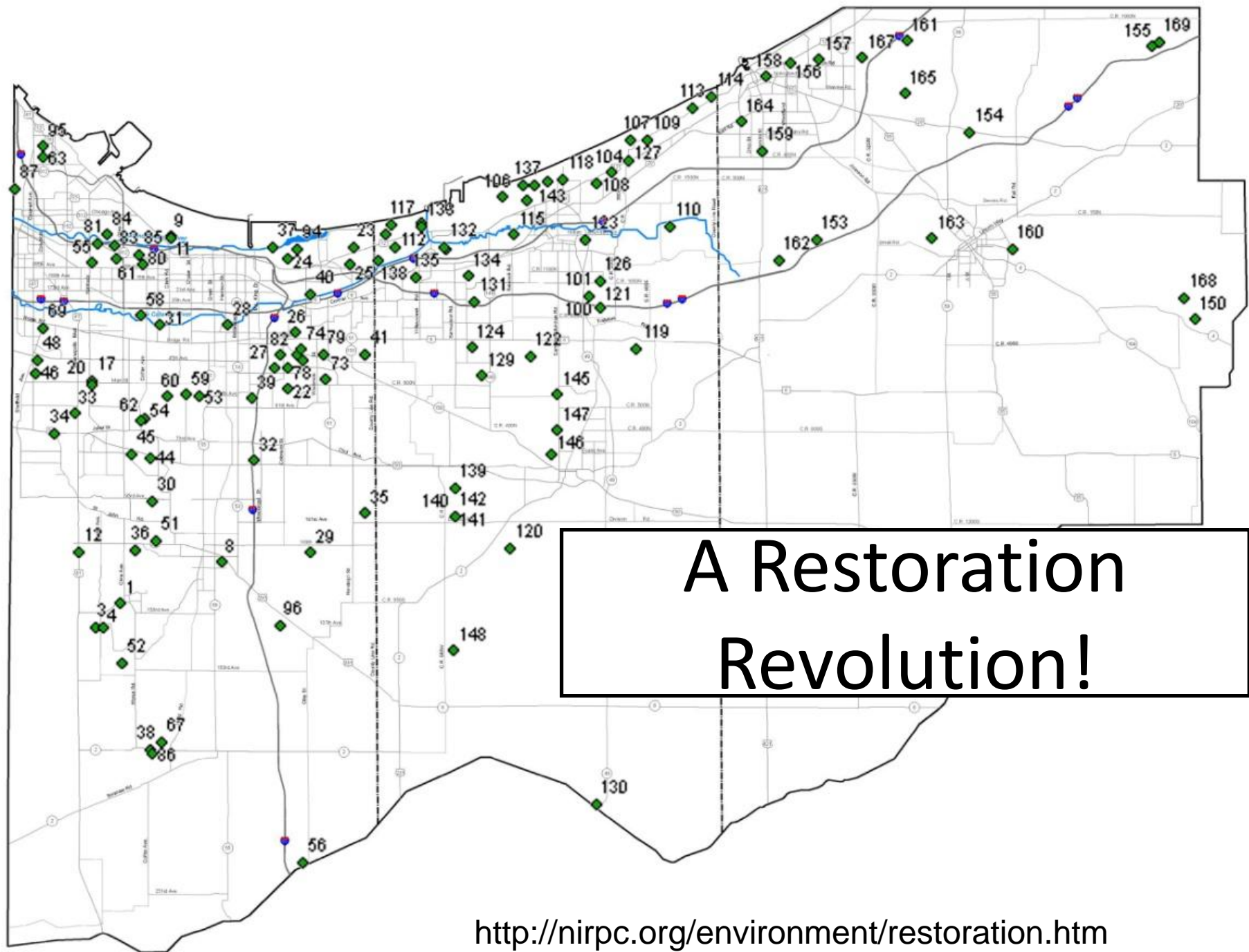


Predicting Restoration Success In Northwest Indiana

Dr. Peter Avis
Department of Biology
Indiana University Northwest
and



**NIRMI IS CURRENTLY SUPPORTED BY GRANTS FROM GAYLORD & DOROTHY DONNELLY FOUNDATION,
ARCELORMITTAL, AND THE INDIANA LAKE MICHIGAN COASTAL PROGRAM**



A Restoration Revolution!

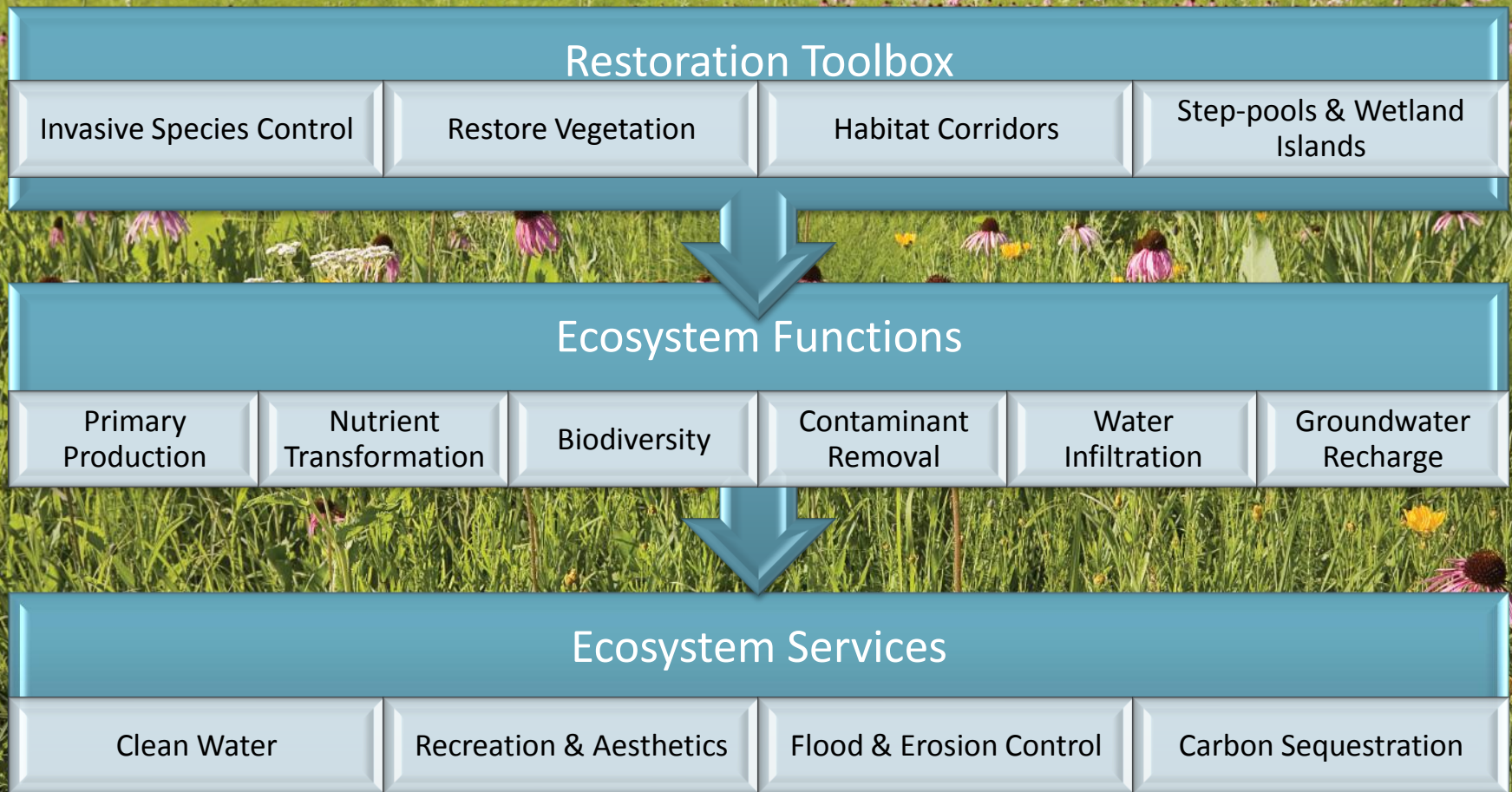
<http://nirpc.org/environment/restoration.htm>

A Restoration Region

- In 2006: 166 documented ecological restorations in Lake, Porter, and LaPorte counties
- Over \$4.7 million of EPA GLRI funding in 2010
- \$28 million Marquette Park renovation



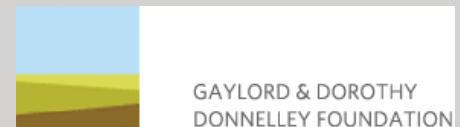
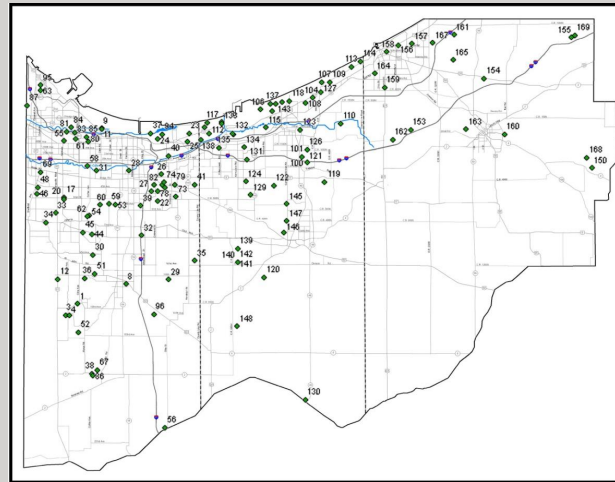
We know restorations provide...



We also know each restoration unique...



ArcelorMittal



We don't know how to predict success



2 years



We don't know the restoration trajectories in time

- **Restoration trajectories** = the accumulation of key ecological components and processes that gauge restoration progress and success at a regional spatial scale and over time



20 years

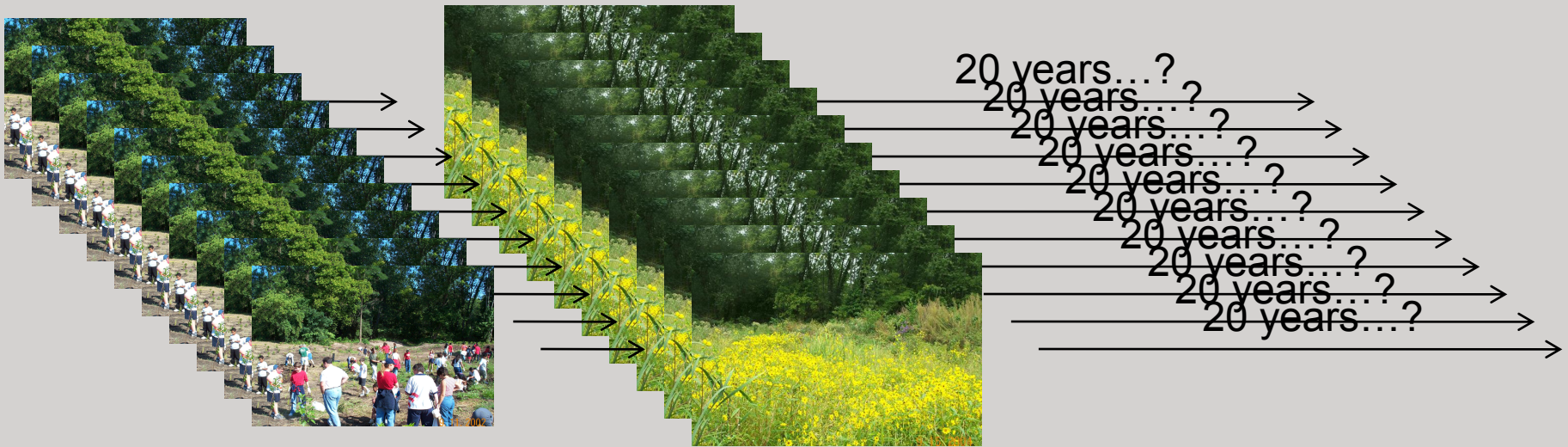


???

We don't know the restoration trajectories in space

- **Restoration trajectories** = the accumulation of key ecological components and processes that gauge restoration progress and success at a regional spatial scale and over time

At 160+ sites in NW Indiana???



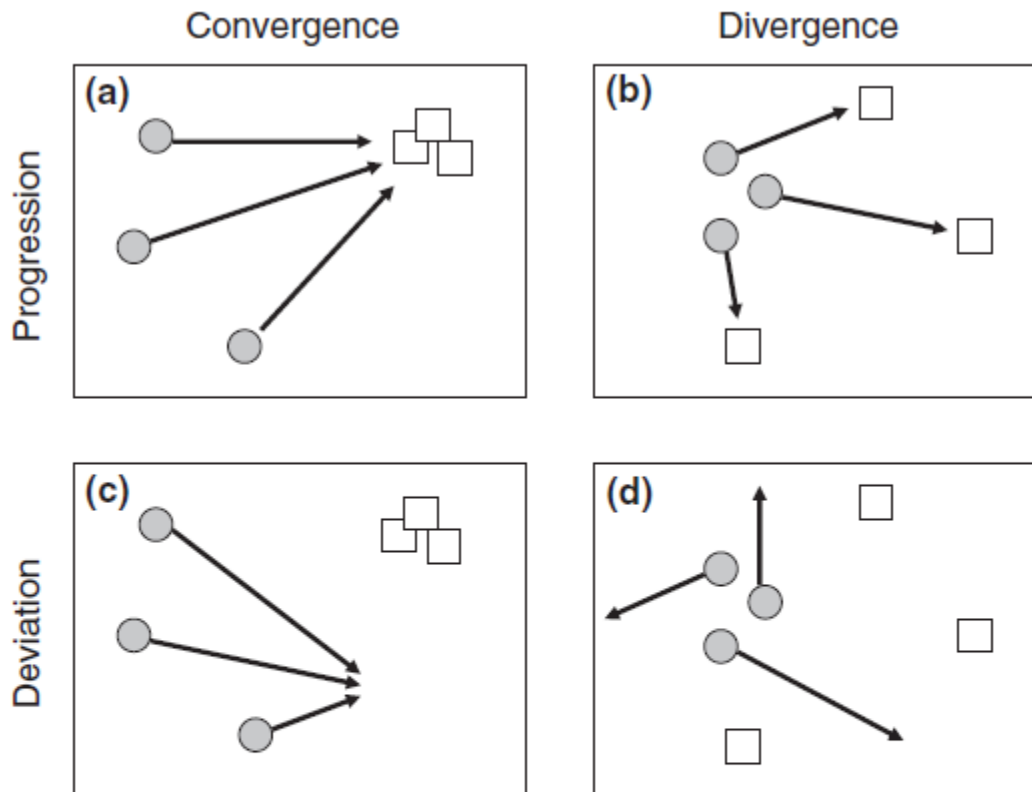


Fig. 1. Given a set of restoration sites (grey circles) and reference targets (squares), four patterns are possible for temporal trajectories (arrows) in species composition: (a) convergence in species composition among restorations and progression towards the target composition, (b) divergence among restorations and progression towards a spectrum of potential targets, (c) convergence among restorations but deviation away from the intended reference targets, (d) divergence among restorations and deviation from intended targets.

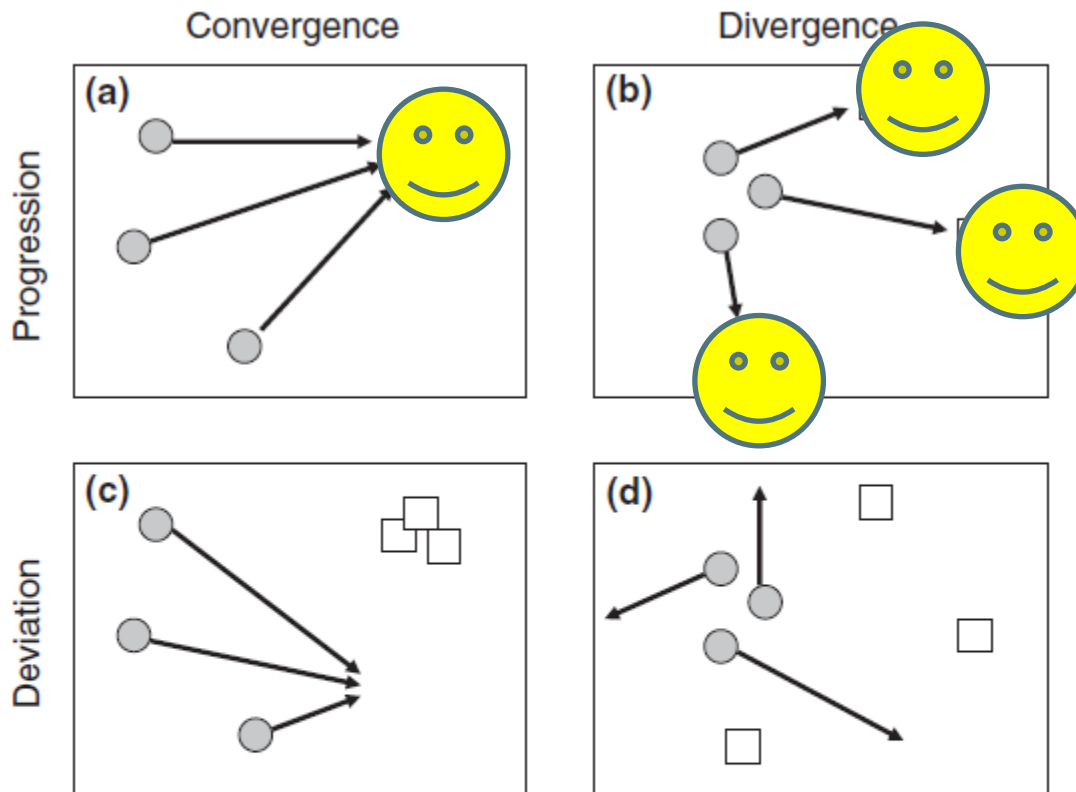


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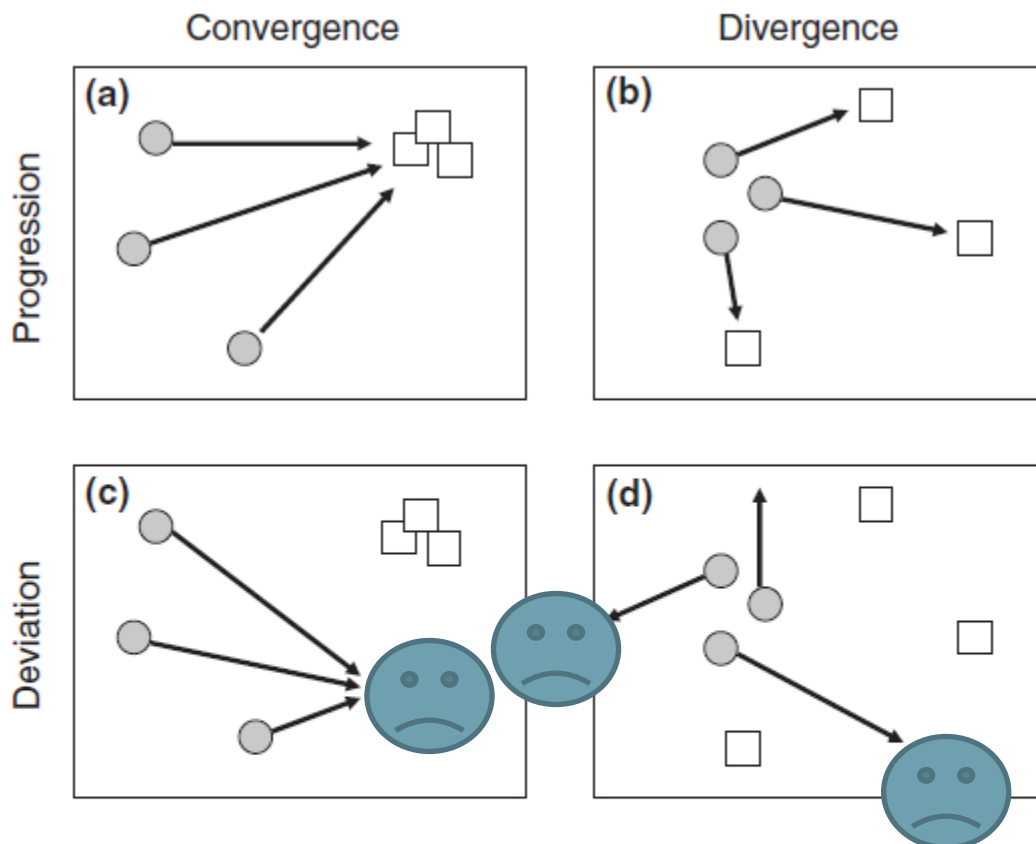
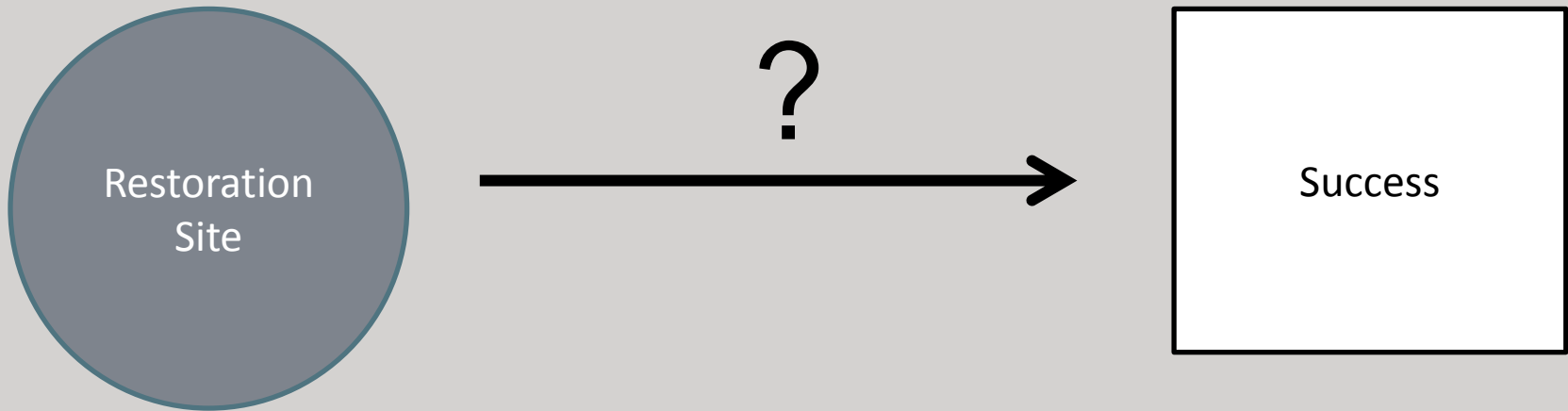


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How do we get...



NIRMI addresses success



A monitoring and data management project
focused on ecological restorations

www.nirmi.org

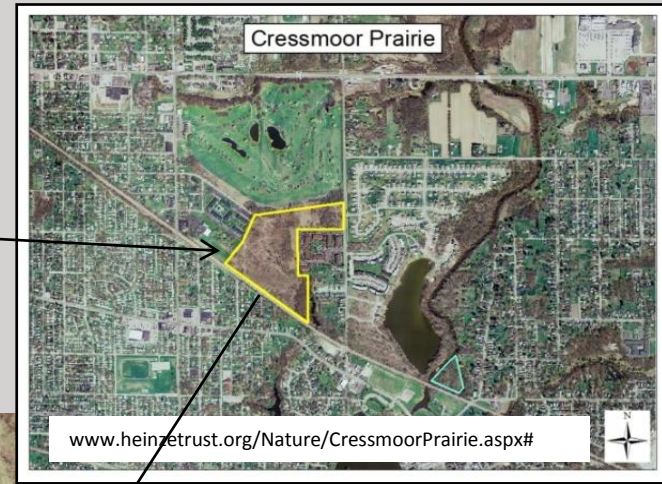
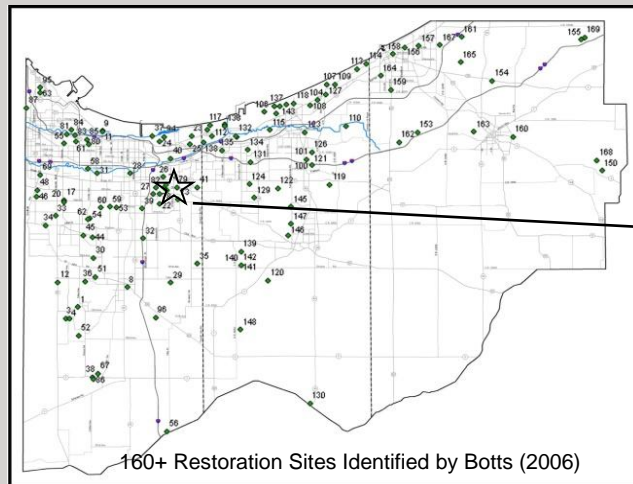
NIRMI

- Initiated in 2010
- Core team of restoration and field ecologists, student interns, and restoration minded partner organizations
- Uses the networking mechanisms of Northern Indiana Consortium for the Environment (NICE) housed at IU Northwest

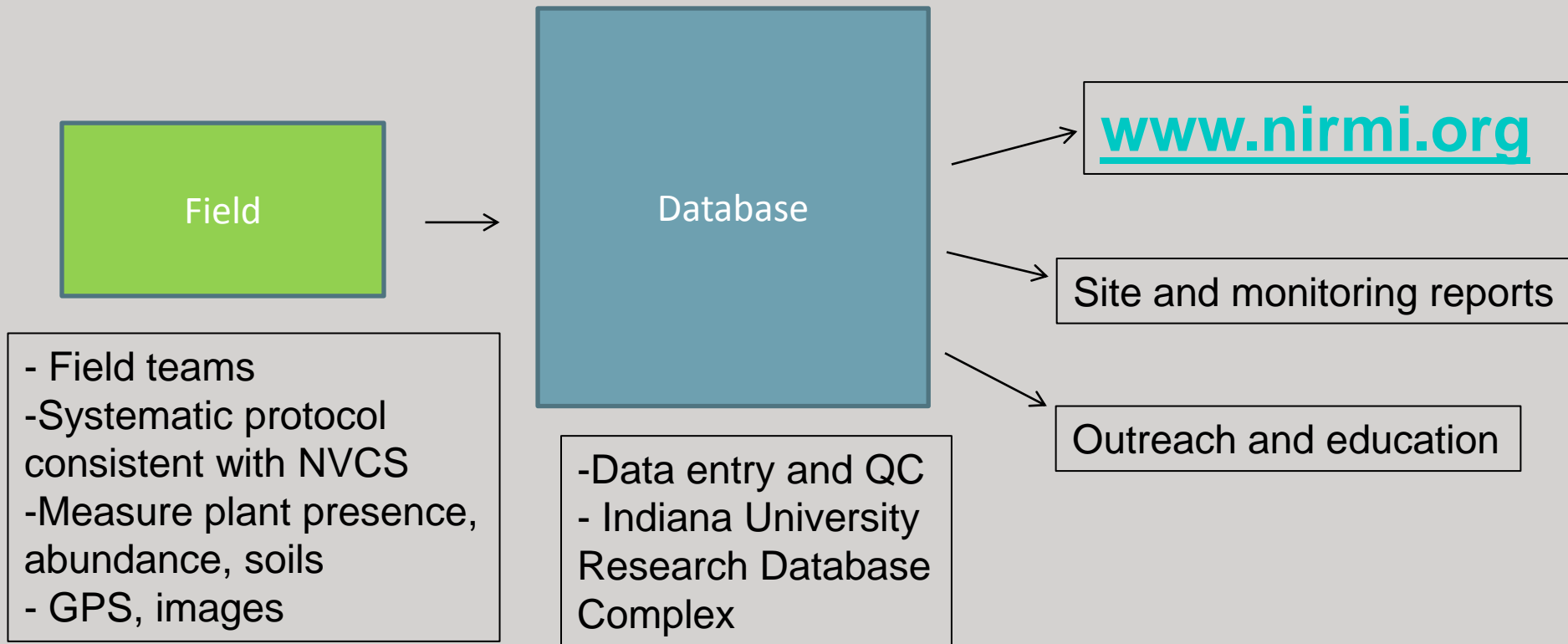
2011 crew in the NIRMI office



How NIRMI does it



Field to Database to Info Sharing



So far, NIRMI...

- 28 sites, 79 plots and counting
- Over 900 plant species identified
- ~14000 data entries
- Over 10 different habitat types
- Range of restoration types
- 10 different conservation organizations
- 6 universities

Cortwright's Prairie: Summary metrics



Cortwright's Prairie - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://discern.uits.iu.edu:8780/?pageNav=2

Most Visited Getting Started Latest Headlines

Cortwright's Prairie



nirmi
Northwest Indiana Restoration Monitoring Inventory

Cortwright's Prairie

[Species List](#) | [Data and Graphs](#) | [Maps](#)

Cortwright's Prairie, a section of the Little Calumet River Prairie and Wetlands, is owned by the city of Gary. The area is a 10 acre site that stretches from Indiana University Northwest north to 80/94 and west around the Gleason Golf Course and park area. The area is one small part of an ambitious, long-term initiative to restore more than 1,000 acres of wetlands, prairie, and savanna. There are more than 150 native plant species that can be found in this prairie land. [Press release](#)

See only species found in:

All Plots ▾ All Years ▾ << Filter

Species list for all plots

To prevent poaching, endangered species are not included in this list. [More info...](#)

Latin Name	Common Name	Map	Native?
Agrimonia gryposepala	tall agrimony		YES
Allium cernuum	nodding wild onion		YES
Ambrosia trifida	giant ragweed		YES
Andropogon gerardii	big bluestem; turkeyfoot		YES
Asclepias syriaca	common milkweed		YES
Asclepias tuberosa	butterfly weed		YES
Aster novae-angliae	New England aster		YES
Coreopsis palmata	prairie coreopsis		YES
Cuscuta gronovii	common dodder		YES
Daucus carota	wild carrot; Queen Anne's lace		NO
Desmanthus illinoensis	Illinois sensitive plant; Illinois bundle flower		YES
Desmodium paniculatum	panicked tick trefoil		YES
Echinacea purpurea	broad-leaved purple coneflower		YES
Elymus canadensis	Canada wild rye		YES
Erigeron annuus	annual fleabane		YES
Erigeron philadelphicus	rattlesnake master		YES
Eupatorium serotinum	late boneset		YES
Gaura biennis	biennial gaura		YES
Helianthus mollis	downy sunflower		YES
Helianthus scaberrimus	false sunflower		YES
Lamium amplexicaule	dead nettle; henbit		NO
Liatris aspera	rough blazing star		YES

Copy data to Excel or other programs:
Latin Name Common Name
Native? Native?
(Ctrl-C to copy to clipboard, Ctrl-V to paste)

Home

Where

How

Who

Data Analysis

Sites

Bock-Higgins

Calumet Prairie

Coffee Creek

Cortwright's Prairie ✓

Greiner

Indiana Dunes

Headquarters

INDU Cowles West

INDU Great Marsh -

Brown West

[...more...]

Done

Inbox - Microsoft O...

Oncourse : FA11 N...

Indiana University R...

Cortwright's Prairie ...

GLRI 2011 Narrative ...

SOLM Avis 9-29-11

NIRMI presentations...

Cortwright's Prairie: Comparisons

NIRMI - Northwest Indiana Restoration Monitoring Inventory - Mozilla Firefox

File Edit View History Bookmarks Tools Help




http://discern.uits.iu.edu:8780/?pageNav=data&mode=percentNative

Most Visited Getting Started Latest Headlines

NIRMI - Northwest Indiana Restorati...

nirmi

Northwest Indiana Restoration Monitoring Inventory



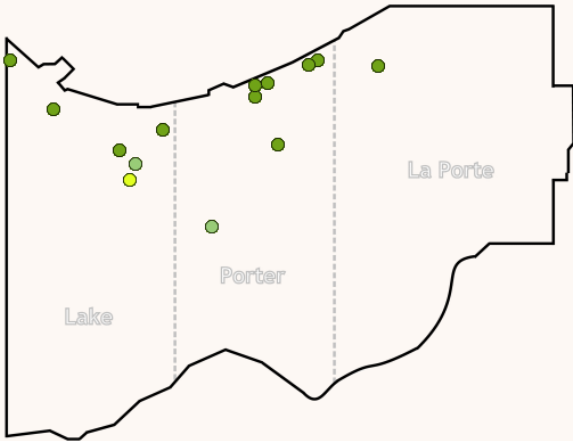
Data Analysis

To explore data patterns across multiple sites, please choose an analysis type.

To examine species lists, maps, and data analysis for a particular site, please click on a site below or select by name at our [sites](#) page.

Percent Native

-- change --



Percent Native

83.33 - 100

66.67 - 83.33

50 - 66.67

33.33 - 50

16.67 - 33.33

0 - 16.67

Site	Percent Native
Indiana Dunes Headquarters	94.29
Calumet Prairie	93.02
INDU Great Marsh - Tansley	92.59
Cortwright's Prairie	92.11
Ivanhoe	90.74

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[...more...]

Done

Inbox - Microsoft O...

Oncourse : FA11 N...

Indiana University R...

NIRMI - Northwest I...

GLRI 2011 Narrative ...

SOLM Avis 9-29-11

NIRMI presentations...

2:30 PM

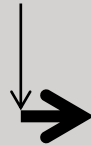
Cortwright's Prairie: Success



Cortwright's Prairie: Success



2000



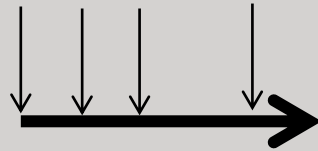
? Community
Composition
? Species Richness
? % natives
? FQI



Cortwright's Prairie: Success



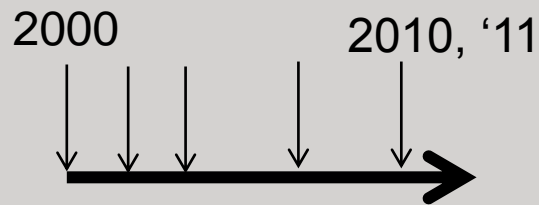
2000



? Community
Composition
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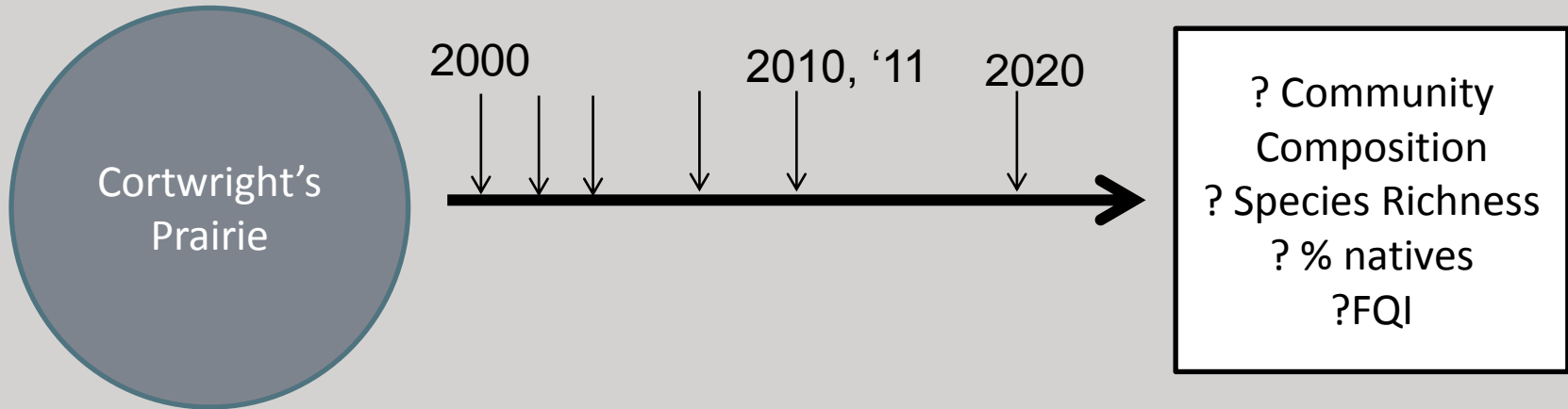
Cortwright's Prairie: Success



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Cortwright's Prairie: Success



Who can use NIRMI?

- **Any restoration minded organization** -- How to restore better? What works where in the region?
- **Educators** – How can restoration focused modules be included in courses?
- **Public and Policy** -- How can I value restoration?
- **Researchers** – What are the impacts of fire across multiple restoration sites?

NIRMI Seeks More Partners:

- If you have monitoring needs (especially if writing a grant proposal) at a restoration...
- If you want to incorporate restoration into your educational courses...
- If you want to know how restorations benefit society, your community...
- If you are interested in research about what happens in restoration...
- ...NIRMI wants you to become a partner
- Visit www.nirmi.org